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ABSTRACT

Guidelines for the construction and use of an attitude instrument are presented, and the application of the instrument to measure student attitude toward economics is described. Attention is directed to the Likert-like summated forced-choice variety of attitude instrument, whereby attitude toward the object is inferred from the summed responses to statements referencing the object. The first phase is scale construction, followed by testing the instrument for consistency and reliability. About 40 to 50 statements that directly address the object need to be developed, with attention to the style and structure of the sentence. The most common number of response categories is five, and each response label is weighted by its response number. Initially, the instrument is administered to a sample of responders from the target population. The mean and standard deviation for each statement are tabulated to determine the worth of the statement. After administering the instrument to the full target group, test reliability is determined Results of three reliability tests for the sample instrument on attitudes toward economics are presented. The full target group for the instrument reliability assessment was a large class of freshman macroeconomics students at Illinois State University during the fall of 1978. The one-page instrument is appended. (SW)

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ATTITUDE ASSESSMENT FOR RESEARCH IN ECONOMIC EDUCATION

by

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ATTITUDE ASSESSMENT FOR RESEARCH IN ECONOMIC EDUCATION

Introduction and Purpose

A growing number of studies appearing in the literature incorporate an attitude variable into multiple regression models to predict cognitive achievement in economics principles courses. Those efforts are to be commended even though, regrettably, results concerning the attitude variable are mixed (1, 4, 8, 9, 12). One potential reason for the variation in results may be attitude instrument design. The research design, methodology and objective all have direct bearing upon the type of attitude instrument used. Nonetheless, instruments of poor design will only hinder assessment of the correct role which attitude may play in predicting cognitive achievement. The purpose of this article is to present simple guidelines for the construction and use of summated forced-choice variety of attitude instrument.

Scale Construction

Attitude can be defined as "an evaluative component associated with a feeling of liking or disliking for social and psychological objects." (11). Psychologists have established that the relevant characteristics of attitude include their selective and acquisition, integration by experimentation, enduring nature, consistency and positive or negative feeling. The attitude dimension is complex.

A clear idea of the particular object toward which the researcher seeks opinions is important. Lack of clarity of the object in the mind of the researcher invites poor focus in the instrument's design.

Development of summated forced-choice attitude instruments as introduced by Rensis Likert is premised upon two important assumptions. First, it is assumed that subjective attitudes can be quantitatively assessed by a numerical score which reflects a person's opinion. Second, it is assumed that each particular statement on the instrument holds the same meaning for all responders. Hence, attitude toward the object is inferred from the summed responses to statements referencing the object.

To begin the construction of an attitude instrument, 40 to 50 statements which directly address the object are created. Each statement seeks an opinion of the object and not a reaction to fact. Including factual statements hopelessly confuses affective with cognitive influences (which may lead to spuriously high correlations with cognitive dependent variables).

The instrument's statements must be grammatically simple, semantically clear, logically unambiguous and strong enough to elicit divergent responses. Or, to say much the same thing negatively, avoid sophisticated language, double-barrelled statements and unarguable statements. To reduce response patterning, include about as many positively as negatively worded statements in random order. The ideal number of response categories lies between 3 and

9 with 5 being the most common. Whatever the response-category labels, they are the same for each statement. Mixing response labels makes accurate interpretation difficult when response weights are summed. The desired number of response categories is a function of how fine an attitude nuance the study warrants and the ability of responders to distinguish such nuances.

Each response label is weighted by its response number (e.g. 1 = strongly agree, 2 = agree, 3 = no opinion, 4 = disagree, 5 = strongly disagree). Obviously, this method of weighting imposes a cardinal measure onto an ordinal structure. However, as long as responders are consistent, the technique maintains the order of response categories. The actual "distance" between response categories is not known. Before summing the response weights, negatively worded statements must have their response scales reversed to provide a meaningful total score. Given the scale mentioned above, a low total score indicates a favorable opinion and a high total score indicates an unfavorable opinion.

Instrument Assessment

The next phase involves testing the instrument for consistency and reliability. A sample of responders from the target population is to complete the form. There must be at least twice as many responders as statements. Tabulation of the mean and standard deviation for each statement provides some evidence of their

worth. Those with strong means (i.e. small or moderate variances) are retained. Those with weak means (i.e. large variances) are discarded as confusing as are those with means contrary to the logical intent of the statement. From those statements remaining after the initial culling, one instrument 10 to 25 statements in length is formed. No standard length prevails but attention should still be paid to the number of positive versus negative statements.

The instrument is now ready to be administered to the full target group. Since attitude is being assessed it is important that the environment be the familiar one, similar for all responders and reasonably calm. Ideally, responders should not have to identify themselves. The final step involves statistical tests for reliability.

Three tests are commonly applied even though any one of them may be sufficient to indicate reliability. The split-half reliability test arbitrarily divides the statements into two halves and measures the correlation between them. The Spearman-Brown prophecy formula may then be used to predict the correlation for the entire instrument. A second test, front-to-back regression uses the statements on one half of the instrument as regressors predicting the total of responses in the second half of the instrument. The higher the multiple coefficient of determination (R^2), the more reliable the instrument. The third test

correlates each statement with the instrument total for all responders. High correlations, again, provide evidence of reliability. There is always the question of validity. Short of some rather onerous validation techniques, validity is commonly assumed although the assumption may be suspect. Hence, even though there is no guarantee of validity, following the procedures above will provide the researcher with the necessary steps for a reliable instrument.

An Application

The above process was utilized to construct an attitude instrument designed to measure student attitude toward "economics." The target group was a single large class of freshman macroeconomics students at Illinois State University during the fall term of 1978. The first two steps of the process will not be discussed here due to space limitations. The resulting instrument is shown in the appendix and was administered on the first class day. The same instrument was administered again during the final week of classes.

Data gathered from the initial administration was subjected to the three reliability tests. The results shown in Table 1 indicate that the instrument is reliable.

Table 1

Reliability Tests (n = 382)

SPLIT-HALF CORRELATION

A. Half 1 to half 2 = .675

B. Spearman-Brown Prophecy Formula = .806

Front-to-Back Regression

A. Front half score as dependent variable:

R^2 = .509

B. Back half score as dependent variable:

R^2 = .543

(Front half = statements 1-7)

(Back half = statements 8-14)

Correlation of Statements to instrument score

Statement	Correlation
1	.540
2	.623
3	.508
4	.659
5	.671
6	.535
7	.649
8	.434
9	.430
10	.620
11	.563
12	.511
13	.483
14	.506

Commonly reduced form learning equations appearing in this journal take the form:

Learning = f (Prior knowledge, ability, maturity, socio-cultural background, experiment)

To this general expression an attitude variable can be introduced. The rationalization is that attitude affects the time a student devotes to a particular course. The final variable introduced into this model is a proxy for effort. All students had the opportunity to engage in a version of Allen Kelly's TIPS (Teaching Information Processing System). The final form of the learning equation with appropriate proxies is:

Post-Tuce score = f (Pre-Tuce score, ACT composite score, age in months, sex (male = 1), Pre-attitude score, Post-attitude score, TIPS total score)

The only variables whose measurement require further explanation are the last three. TIPS total score is the number of correct responses from all TIPS surveys completed by the student. Pre- and Post-attitude scores are the summed responses (properly reversed for negative statements) of the instrument. All regressors are assumed to be independent which justifies OLS techniques.

Results

Econometric results for the equation are:

$$y = -0.950 + 0.087x_1 + 0.313x_2 + 0.261x_3 + 0.047x_4$$
$$\qquad\qquad (2.54) \quad (3.68) \quad (3.52) \quad (3.07)$$
$$- 0.061x_5 + 0.021x_6 + 0.060x_7$$
$$(1.28) \quad (1.74) \quad (0.12)$$

$R^2 = .3979$ $\quad F = 17.18$ $\quad N = 190$

(Student t values are in parentheses)

Where:

X_1 = Post-attitude score
X_2 = ACT Composite score
X_3 = Pre-Tuce score
X_4 = TIPS total score
X_5 = Pre-attitude score
X_6 = Age in months
X_7 = Sex (male = 1)
Y = Post-Tuce score

Clearly, Post-attitude (X_1) is significant at very close to the 99% level. ACT composite (X_2), Pre-Tuce (X_3) and TIPS (X_4) scores are all highly significant. Age and sex are not significant and Pre-attitude has a perplexing sign. These results must be regarded with caution for several reasons. Only one of many possible specifications has been discussed. Including the attitude variable raises the question of proper model specification due to possible simultaneity between Post-Tuce and Post-Attitude scores. Multicollinearity could logically exist between TIPS and Pre-Tuce or Post-Attitude scores. Omitting the three insignificant variables from the above model reveals that the remaining regressors are little changed either in magnitude or significance level.

$$Y = 1.504 + 0.077x_1 + 0.296x_2 + 0.269x_3 + 0.049x_4$$
$$\qquad\qquad (2.47) \quad (5.44) \quad (3.65) \quad (3.18)$$
$$R^2 = .3806 \qquad F = 28.42 \qquad N = 190$$

Conclusions

The role of attitude in learning may be better assessed through a well constructed instrument. With attention to psychological tenets and checks for reliability many of the necessary conditions for constructing a useful summated forced-choice instrument can be easily met. Initial results of a study using the "Attitude Toward Economics" measure in a standard reduced form learning model provided significant statistical results for the attitude variable. However, the problems of specification and collinearity are yet to be fully addressed.

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APPENDIX

Attitude Toward Economics *

Please mark your responses to each statement acccrding to the following scale:

1 = strongly agree 2 = agree 3 = undecided 4 = disagree 5 = strongly disagree

1. I enjoy reading articles concerning economic topics.
2. I hate economics.
3. Economics is easy for me to understand.
4. Economics is dull.
5. I enjoy economics.
6. Studying economics is a waste of time.
7. Economics is one of my most dreaded courses.
8. On occasion I read an unassigred book in economics.
9. I would be willing to attend a lecture by an economist.
10. Economics is a very difficult subject for me.
11. Economics is one of my favorite courses.
12. I use economic concepts to analyze situations.
13. Economics is practical.
14. Economic ideas are dumb.

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